Is it really so bad? A review of positive experiences of personnel wintering over in Antarctica

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Introduction

For over a century scientists in Antarctica have primarily been concerned with the natural sciences in the disciplines of meteorology, glaciology, geology, oceanography and biology (Suedfeld and Weiss, 2000). It is only relatively recently that the social and behavioural sciences have been explored in Antarctica. There are no indigenous or permanent inhabitants of Antarctica, it is the only one whose inhabitants are primarily concerned with scientific research and it is an environment in which communities of different nationalities work and live together in (more or less) perfect harmony. As such, it is an extremely interesting place to study psychology and adaptations to new and unique environments.

Despite harsh environmental conditions, humans have inhabited Antarctica for over 100 years, since it was discovered and 'conquered' during the heroic era. Since the International Geophysical Year of 1957-58 and the signing of the Antarctic Treaty System, there has been continuous human presence on the ice in the form of isolated research stations, many of which are occupied throughout the entire year.

Working and living in Antarctica introduces some unusual and interesting experiences and opportunities. The unique situation requires personnel living in Antarctica to undergo a degree of psychological adaptation to the isolated, confined and environmental (referred to as ICE) circumstances experienced. Psychological research gathered on personnel living in Antarctica and other unusual ICE environments (for example; remote military posts, submarines and outer space stations) have been clustered on the negative rather than the positive effects (Mocellin, 1995). It is important that an accurate and balanced viewpoint on polar psychological experiences is understood, not only for its appropriate application in the Antarctic and Arctic, but also in analogous extreme and unusual environments such as extended space flights and space habitation.

The objective of this paper is to review the growing body of literature that suggests in addition to traditional psychological reporting of negative experiences for personnel living in Antarctica there are positive ones as well.

In search of balance

Early psychological research in Antarctica clustered around negative incidents (for example Gunderson and Nelson, 1963, Taylor, 1969), and more often than not, there was no mention of positive experiences which must have occurred (Suedfeld and Steel, 2000). Such accounts emphasised the dangers, stresses and deprivations experienced by personnel. Group conflict, mental disturbance, heavy drinking and disagreements with other personnel were highlighted as key indicators of psychological hardship (Taylor, 1969).

In response to research such as that described above, Antonovsky (1987 cited in Palinkas 2003) coined the term 'salutogenic' to convey the idea that under certain conditions, stress could actually be beneficial and health promoting and not simply destructive to well being. This was a fundamental breakthrough in research on the relationship between stress and illness, and influenced the thinking of medical and behavioural scientists about the factors that form the basis of human health (no author, 2004). Positive psychological experiences were arguably overlooked due to the basis of behavioural studies that historically have emphasised a negative rather than a positive view of the experience (Mocellin and Suedfeld, 1991).

It is not argued that events with serious outcomes do not exist in Antarctica; in fact, these are often brought to the attention of media and the scientific literature. Rare events such as a computer being destroyed in a moment of anger (Wood *et al*., 1996) or a fight between two cooks at McMurdo Station (Spielmann, 1996) do illustrate the extent to which interpersonal tensions can escalate. On the other hand, the number of returning winterers (for example, 25% of the Australians return for two or more winters (Wood *et al*., 2000)) suggests that their year in the Antarctic was rewarding enough that they want to repeat the experience (Wood *et al*., 2000). Steel (2000) also notes the return rate to polar environments is high, and that there are many examples where personnel are frustrated in their desire to go back to the ice when it is not possible.

It is apparent that the normal aspects of Antarctic life can be quite pleasant (hence the returnees) and that extreme events do occur. In an effort to have a balanced understanding of life in ICE conditions in Antarctica, it is important that we

understand and appreciate the positive aspects, and how they help to ameliorate the negative effects.

Social and Environmental Stressors in Antarctica

The men and women who live in Antarctic stations and field camps are subjected to a number of stressors that can be grouped into three categories – isolation, confinement and environment (ICE) (Sells, 1973 cited in Suedfeld and Steel, 2000). Generally, between the months of February and August (February to October at the South Pole) the stations are isolated from the outside world with darkness and weather conditions that prevent travel to and from the continent. The isolation of personnel from family and friends back home leads to emotional deprivation on varying scales. Crises such as the death of a family member or deterioration of marital relations become magnified by the separation and distance between the individuals involved. Crews who winter-over often experience some level of strain or conflict with external agencies usually in reference to delays in replacement supplies or problems with communication (delays in transmission, distortion of audio and visual signals and inability to detect nonverbal cues often leading to misinterpretations) (Palinkas, 2001).

Paradoxical to the isolation from the outside world is the lack of isolation, or confinement, within the station. During 1988 and 1989, research was conducted at McMurdo and South Pole Stations to investigate the pressures of confinement (Carrare *et al*., 1991 cited in Palinkas, 2003). Participants complained that the lack of privacy and constant gossip had a negative effect on social relations, especially between men and women. Consequently, as much as 60% of one's leisure time is spent alone in a dorm room.

Living and working spaces are often one in the same or in close proximity to one another. This leads to the situation where there is little separation between work and leisure, and that one interacts with the same group of individuals in both sets of activities. The constant interaction creates potential for conflict. Because of the extreme cold, darkness and policies designed to promote personal safety, it is not always a viable option to escape the confinement and remove oneself from tense situations.

Finally, the environment itself poses a significant stressor. Environmental stressors that residents in Antarctica have to contend with include very low humidity, exposure to extreme cold when working outdoors, extreme light-dark cycles and the high altitude (especially at the South Pole which is situated 2835 metres above sea level). Among the studied physiological responses of human inhabitants to these environmental conditions is a complete absence of Stage IV sleep as well as a sizable reduction in the amount of Stage III and REM sleep, a disruption of circadian rhythms (the biological rhythm that is more or less synchronised to a 24 hour cycle, e.g. the pattern of sleeping and waking (Robinson and Davidson, 1999)), dyspnea (difficulty in breathing, characterised by an awareness of the effort of inappropriate breathing (Robinson, 1999)), headaches, suppression of the immune system, and disruption of thyroid function (Guenter *et al*., 1970 and Reed *et al.*, 1986 cited in Palinkas, 2003).

Positive psychological experiences of personnel in Antarctica

It is only in the last three decades that polar psychology has evolved as a discipline, and approximately 10 years since literature focussing on positive experiences and positive adaptation have been documented in the literature (Wood *et al*., 2000). As such, the literature regarding positive experiences is relatively small. The remainder of this report will focus on the positive psychological experiences and adaptations documented.

Evidence is overwhelming that for many ICE dwellers (at least for those whose mission did not end in total disaster) the experience is an important and moving part of their life, often perceived as an impetus for internal growth and deepening, to be remembered with pride (Suedfeld and Steel, 2000). After returning from ICE experiences personnel often come back with more tolerance and affection to others and higher self-confidence (Suedfeld, 1998), this is also supported by Palinkas (2004)….

> *"Over wintering is a well defined challenge that they can meet successfully; it raises self-esteem, self-efficacy and self-confidence. It teaches ways of coping with stressful situations"*

One of the earliest documented examples of improvement in performance and well being during an extended period of isolation and confinement in an extreme environment, was obtained from examination of mood disturbances during winter

among 657 men who over wintered between 1963 and 1974 (Palinkas, 1991). When symptoms of the winter over syndrome (depression, irritability, insomnia and cognitive impairment) were separated into sleep-related and non-sleep-related an interesting pattern became apparent. Complaints of disturbed sleep were positively associated with the severity of the physical environment in early winter but not in late winter. The personnel in this study managed to adapt to the conditions of the surrounding physical environment, thereby minimising the impact of this environment on their sleep patterns. However, other symptoms (feeling lonely, annoyed, critical of others and unable to concentrate) were inversely associated with the severity of the physical environment of the station in both early and late winter. In other words, the more severe the physical environment, the fewer mood disturbances that were not sleep related (Palinkas, 1991).

It is commonly assumed that enforced socialisation in a confined environment would be stressful to participants, particularly those unfamiliar with the surrounding environment. Mocellin (1995) conducted a study examining the enforced socialisation onboard two confined ships in Antarctic waters and it was hypothesised that anxiety would increase over time as the result of anticipation of further environmental stress. The State-Trait Anxiety Inventory (STAI; Biaggio *et al*., 1976 cited in Mocellin 1995) was administered to the crews. Contrary to the belief of the researcher and many others, anxiety levels did not increase over time, even during traumatic events or after participants had experienced them. The lack of conformity with initial expectations was considered to be explained by (a) the use of stress-reduction strategies by the officers of the ships and (b) group and individual characteristics that facilitated the endurance of taxing demands associated with the various situations experienced. Many of the scientists and crew on board the ships had previous experience on other long-range cruises in remote settings and it was concluded that similarities in experience rather than environmental factors (Suedfeld, 1991) could have acted to reduce stress. This is supported by Palinkas and colleagues (1995) who reported that the same mechanisms used to cope with everyday stressors are used to cope with the stresses of life in the Antarctic.

The study by Wood and colleagues (2000) sought to examine the scope of psychological experiences perceived by 104 Australian winter personnel at four stations during two-austral winters. A research questionnaire was administered to each participant twice per week, which consisted of 48 quantitative items, two checklists and four open-ended questions. The questionnaire permitted users to type

in as much or as little as they chose for each of the open-ended questions. This style of approach allows respondents to present whatever thoughts they think are relevant and lets them express themselves in their own words.

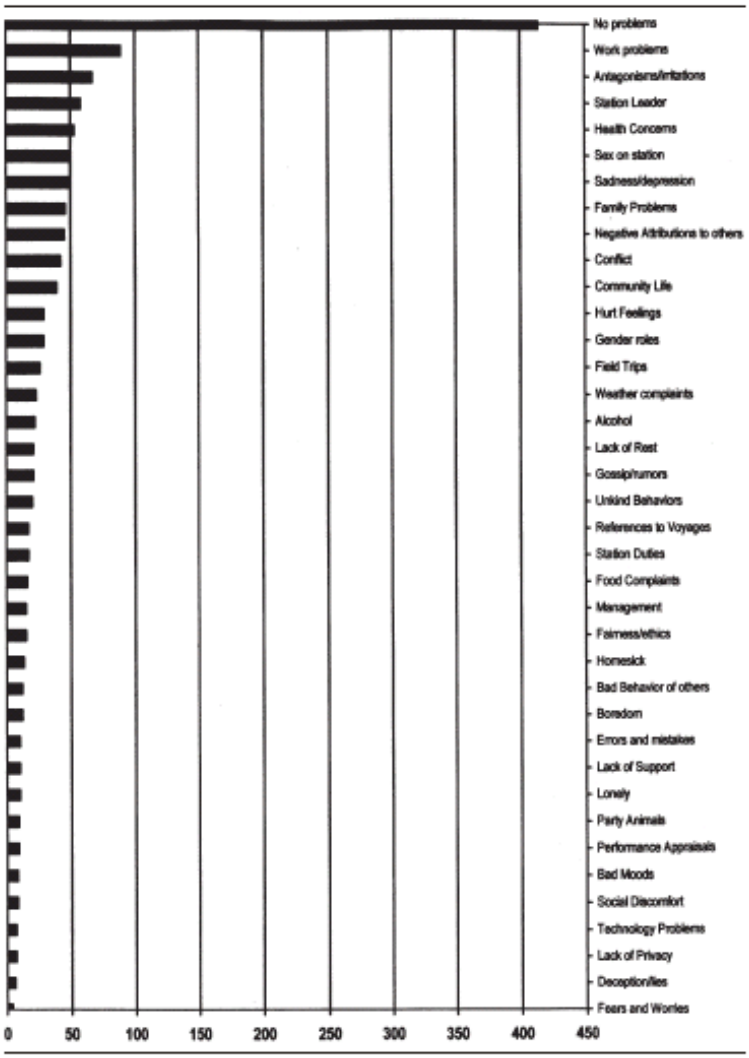

Figure 1: Frequencies of Negative Response Themes. Source: Wood *et al*., 2000

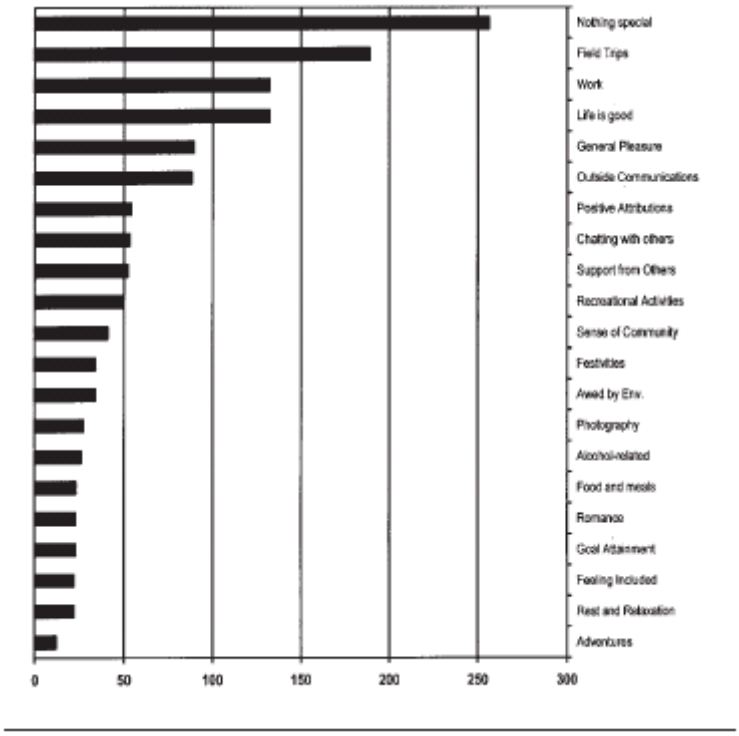

Figure 2: Frequencies of Positive Response Themes. Source: Wood *et al*., 2000

The lists of positive and negative experiences in Figures 1 and 2 indicate a lot, both about the Antarctic winter experiences and about the type of people who volunteer for such duty. Although the list of negative experiences is lengthy, most events are relatively rare. It was concluded that this could indicate that individuals adapt to many of the less-than-pleasant aspects of Antarctic life. On the other hand, the list of positive experiences is relatively short, but the frequency in which positive experiences are reported is much greater than for most of the negative experiences.

The winter over syndrome is often interpreted as the inevitable consequence of the stress associated with the ICE conditions of the Antarctic winter. Despite the potential degradation to well being and health, the winter over experience does not appear to have any adverse long-term effects. In fact, exposure to such stressors may actually present some long-term health benefits. Palinkas (1986) examined the subsequent first hospital admissions of 328 Navy men who have wintered over on six small Antarctic research stations and compared them with a control group of 2396 Navy winter over men who were assigned elsewhere. The analysis of individuals was based on medical and service history records as well as screening data. The two groups were followed for a maximum of 15 years, with an average follow up of 5.4 years. The results indicated that the winter over personnel experienced 20% fewer total first hospital admissions subsequent to their return from Antarctica than did the

control group. When analysed for selected diseases the winter over group displayed significantly fewer admissions such as neoplasm's (73% fewer admissions); endocrine, nutritional and metabolic diseases (60% fewer admissions); as well as declines in admissions for mental disorders (36% fewer admissions). It can be concluded that certain individuals are likely to present some health benefits from wintering over in Antarctica.

The research discussed presents a not so dismal view of the Antarctic in that personnel do enjoy themselves and to a great extent, and have many positive experiences and adaptations to the environment in which they live.

Future directions

One of the long-standing problems of Antarctic (and more generally, ICE) psychology has been the small groups available for research. Most stations (except McMurdo) house relatively few people, especially during the winter. A solution discussed by Suedfeld and Weiss (2000) would be to develop international collaborations; this would enable investigators to build up the sample size by incorporating participants from a larger number of stations. The results would therefore be more generalisable, reducing the effects of monocultural sampling. Making comparisons across sites and groups would improve the quality and statistical power of the findings. Obviously, this is a direction that polar psychologists could work towards.

Conclusions

Unfortunately, there is not a lot of literature that is specifically directed toward understanding positive experiences and outcomes of the winter over members in Antarctica. Researchers have held a biased view of polar and other unusual and potentially dangerous environments for years, leading to the erroneous assumption that such environments inevitably lead to heightened levels of anxiety and other negative health outcomes. However, more recent and ongoing studies are bringing about a more accurate and balanced view on psychological issues facing habitants of Antarctica, particularly those who winter over. The results obtained from Wood and colleagues (2000) indicate that even in the sparse environment of Antarctic winters, most people had more positive than negative experiences. Findings such as these

contradict the traditional dogma of the Antarctic as a barren wasteland where people struggle for their very lives and souls. It suggests that life in the Antarctic is quite liveable and enjoyable and that the inhabitants share many of the common problems of everyday life – albeit to a different degree. The long-term after-effects of ICE experiences are strikingly positive. Scientific data and self-reports identify that people who have come through a particularly hard or demanding experience are mentally healthier, more successful, and more insightful than they had been (for example, Palinkas, 1986).

References

Gunderson, E.K.E., and Nelson, P.D., 1963, "Biographical predictors of performance in an environment", *Journal of Psychology*, vol. 61, pp 59-67.

Mocellin, J.S.P., and Suedfeld, P., 1991, "Voices from the Ice: Diaries of Polar Explorers", *Environment and Behaviour*, vol. 23, pp 704-722.

Mocellin, J.S.P., 1995, "Levels of anxiety aboard two expeditionary ships", *Journal of General Psychology*, vol. 122, iss. 3, pp 317-323.

No author, 2004, *Aaron Antovosky 1923-1994*, retrieved 4 January 2005, from: http://www.angelfire.com/ok/soc/aa.html

Palinkas, L.A., 1986, "Health and performance of Antarctic winter-over personnel: a follow up study", *Aviation, Space and Environmental Medicine*, vol. 57, pp 549-559.

Palinkas, L.A., 1991, "Effects of physical and social environments on the health and well-being of Antarctic winter-over personnel", *Environment and Behaviour*, vol.32, pp 782-789.

Palinkas, L.A., Suedfeld, P., and Steel, G.D., 1995, "Psychological functioning among members of a small polar expedition", *Aviation, Space, and Environmental Medicine*, vol. 66, pp. 943-950.

Palinkas, L.A., 2001, "Psychosocial Issues in Long-Term Space Flight: Overview", *Gravitational and Space Biology Bulletin*, vol. 14, iss. 2, pp 25-33.

Palinkas, L.A., 2003, "On the Ice: Individual and Group Adaptation in Antarctica", retrieved 10 December 2004, from: www.sscnet.ucla.edu/anthro/bec/papers/Palinkas_On_The_Ice.pdf

Palinkas. L.A., 2004, "The Bright Side of Space Travel", retrieved December 10, 2004, from: http://whyfiles.org/124space_station/5.html

Robinson, M., and Davidson, G. (eds), 1999, "Chambers 21st Century Dictionary", Chambers Harrap Publishers Ltd, Edinburgh.

Spielmann, P.J., 1996 (October 14) "Tempers heat up in Antarctica", *Houston Chronicle Interactive [online],* http://www.chron.com/content/chronicle/world/96/10/14/antactica.html

Steel, G., 2000, "Polar bonds: environmental relationships in the polar regions", *Environment and Behaviour*, vol. 32, iss. 6. pp 796 -817

Suedfeld, P., 1991, "Groups in isolation and confinement: Environments and experiences". In A.A. Harrison, Y.A. Clearwater, and C.P. McKay (Eds), "From Antarctica to outer space", (pp 135-145), New York, Springer-Verlag

Suedfeld, P., 1998, "Homo invictus: the indomitable species", *Canadian Journal of Psychology*, vol. 38, pp 164-173.

Suedfeld, P., and Steel, G.D., 2000, “The Environmental Psychology of Capsule Environments’, *Annual Review of Psychology*, vol. 51, pp 227-253.

Suedfeld, P., and Weiss, S., 2000, “Antarctica: Natural Laboratory and Space Analogue for Psychological Research”, *Environment and Behaviour*, vol. 32, no. 1, pp 7-17.

Taylor, A.J.W., 1969, “Ability, stability, and social adjustment among Scott Base personnel”, *Antarctic Occupational Psychology*, vol. 2, iss. 43, pp 81-93.

Wood, J.A., Lugg, D.J., Harm, D.L., and Eksuzian, D.J., 1996, “Psychological considerations for humans in bioregenerative life support systems”, paper presented at the 31st COSPAR Scientific Assembly, Birmingham, UK.

Wood, J.A., Hysong, S.J., Lugg, D.J., and Harm, D.L., 2000, “Is it really so bad? A comparison of positive and negative experiences in Antarctic Winter Stations”, *Environment and Behaviour*, vol. 32, no.1, pp 84-110.